LREP Nixon & Vanderhye
CLMN Number of Claims: 11
ECL Exemplary Claim: 1
DRWN 5 Drawing Figure(s); 4 Drawing Page(s)
LN.CNT 884

=> d his

(FILE 'HOME' ENTERED AT 11:12:56 ON 13 AUG 2001)

FILE 'USPATFULL' ENTERED AT 11:13:09 ON 13 AUG 2001
L1 656 S NANOCRYSTAL?
L2 347 S QUANTUM DOT?
L3 962 S L1 OR L2
L4 208 S L3 AND CORE?
L5 57 S L4 AND SHELL?
L6 29 S L5 AND LINK?

=> b medline

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	27.31	27.46

FILE 'MEDLINE' ENTERED AT 11:15:35 ON 13 AUG 2001

FILE LAST UPDATED: 6 AUG 2001 (20010806/UP). FILE COVERS 1958 TO DATE.

On April 22, 2001, MEDLINE was reloaded. See HELP RLOAD for details.

MEDLINE now contains new records from the former NLM HEALTH STAR database. These records have an Entry Date and Update Date of 20010223.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2001 vocabulary. Enter HELP THESAURUS for details.

The OLDMEDLINE file segment now contains data from 1958 through 1965. Enter HELP CONTENT for details.

Left, right, and simultaneous left and right truncation are available in the Basic Index. See HELP SFIELDS for details.

THIS FILE CONTAINS CAS REGISTRY NUMBERS FOR EASY AND ACCURATE SUBSTANCE IDENTIFICATION.

=> s l6

75 NANOCRYSTAL?
6709 QUANTUM
13930 DOT?
60 QUANTUM DOT?
(QUANTUM(W)DOT?)
62555 CORE?
10670 SHELL?
275570 LINK?
L7 1 L5 AND LINK?

=> d ti ab

L7 ANSWER 1 OF 1 MEDLINE

TI Imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network.

AB This paper presents findings of the creation of biomimetic ion-gating properties with **core-shell** nanoparticle network architectures. The architectures were formed by hydrogen-bonding **linkages** via an exchange-cross-**linking**-precipitation reaction pathway using gold nanoparticles capped with thiolate **shell** and alkylthiols terminated with carboxylic groups as model building blocks. Such network assemblies have open frameworks in which void space is in the form of a channel or chamber with the nanometer-sized **cores** defining its size, the geometric arrangement defining its shape, and the **shell** structures defining its chemical specificity. The formation of the network **linkages** via head-to-head hydrogen-bonded carboxylic terminals and the reversible pH-tuned structural properties between neutral and ionic states were characterized using infrared reflectance spectroscopic technique. The biomimetic ion-gating properties were demonstrated by measuring the pH-tuned network "open-close" responses to charged redox probes. Such redox responses were shown to depend on the degree of protonation-deprotonation of carboxylic groups at the interparticle **linkages**, **core** sizes of the nanoparticles, and charges of the redox probes. Differences in structural networking, pH-tuning, and electrochemical gating properties were identified between the network films derived from nanoparticles of two different **core** sizes (2 and 5 nm). The mechanistic correlation of these structural properties was discussed. These findings have added a new pathway to the current approaches to biomimetic molecular recognition via design of **core-shell** nanoparticle architectures at both **nanocrystal** and molecular scales.

=> b biosis

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.35	27.81

FILE 'BIOSIS' ENTERED AT 11:15:59 ON 13 AUG 2001

FILE COVERS 1969 TO DATE.
CAS REGISTRY NUMBERS AND CHEMICAL NAMES (CNs) PRESENT
FROM JANUARY 1969 TO DATE.

RECORDS LAST ADDED: 8 August 2001 (20010808/ED)

The BIOSIS file has been reloaded. Enter HELP RLOAD and HELP REINDEXING for details.

=> s l6

90	NANOCRYSTAL?
9948	QUANTUM
15735	DOT?
17	QUANTUM DOT?

(QUANTUM(W)DOT?)
75851 CORE?
34541 SHELL?
261250 LINK?
L8 0 L5 AND LINK?

=> logoff y

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.74	28.55

STN INTERNATIONAL LOGOFF AT 11:16:12 ON 13 AUG 2001

Trying 3106016892...Open

Welcome to STN International! Enter x:x
LOGINID:SSSPTAU182CXC
PASSWORD:
TERMINAL (ENTER 1, 2, 3, OR ?):2

* * * * * * * * * * Welcome to STN International * * * * * * * * * *

NEWS	1		Web Page URLs for STN Seminar Schedule - N. America
NEWS	2	Dec 17	The CA Lexicon available in the CAPLUS and CA files
NEWS	3	Feb 06	Engineering Information Encompass files have new names
NEWS	4	Feb 16	TOXLINE no longer being updated
NEWS	5	Apr 23	Search Derwent WPINDEX by chemical structure
NEWS	6	Apr 23	PRE-1967 REFERENCES NOW SEARCHABLE IN CAPLUS AND CA
NEWS	7	May 07	DGENE Reload
NEWS	8	Jun 20	Published patent applications (A1) are now in USPATFULL
NEWS	9	JUL 13	New SDI alert frequency now available in Derwent's DWPI and DPCI

NEWS EXPRESS	July 11 CURRENT WINDOWS VERSION IS V6.0b, CURRENT MACINTOSH VERSION IS V5.0C (ENG) AND V5.0JB (JP), AND CURRENT DISCOVER FILE IS DATED 06 APRIL 2001
NEWS HOURS	STN Operating Hours Plus Help Desk Availability
NEWS INTER	General Internet Information
NEWS LOGIN	Welcome Banner and News Items
NEWS PHONE	Direct Dial and Telecommunication Network Access to STN
NEWS WWW	CAS World Wide Web Site (general information)

Enter NEWS followed by the item number or name to see news on that specific topic.

All use of STN is subject to the provisions of the STN Customer agreement. Please note that this agreement limits use to scientific research. Use for software development or design or implementation of commercial gateways or other similar uses is prohibited and may result in loss of user privileges and other penalties.

* * * * * * * * * * * * * * STN Columbus * * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 10:35:53 ON 13 AUG 2001

=> b ca

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.15	0.15

FILE 'CA' ENTERED AT 10:36:01 ON 13 AUG 2001
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.

for records published or updated in Chemical Abstracts after December 26, 1996), unless otherwise indicated in the original publications.

FILE COVERS 1947 - 9 Aug 2001 VOL 135 ISS 8
FILE LAST UPDATED: 9 Aug 2001 (20010809/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

This file supports REGlstRY for direct browsing and searching of all substance data from the REGISTRY file. Enter HELP FIRST for more information.

The CA file now provides online access to patents and literature covered in CA from 1947 to the present. On April 22, 2001, bibliographic information and abstracts were added for over 2.2 million references published in CA from 1947 to 1966.

The CA Lexicon is now available in the Controlled Term (/CT) field. Enter HELP LEXICON for full details.


```
=> s nanocrystal?

L1       11922 NANOCRYSTAL?

=> s l1 and core?

        232248 CORE?
L2         423 L1 AND CORE?

=> s l2 and shell?

        118627 SHELL?
L3         112 L2 AND SHELL?

=> s l3 and link?

        289149 LINK?
L4          10 L3 AND LINK?

=> d ti l-10


L4   ANSWER 1 OF 10  CA  COPYRIGHT 2001 ACS
TI   Core-Shell Gold Nanoparticle Assembly as Novel
     Electrocatalyst of CO Oxidation

L4   ANSWER 2 OF 10  CA  COPYRIGHT 2001 ACS
TI   Semiconductor nanocrystal probes for biological applications

L4   ANSWER 3 OF 10  CA  COPYRIGHT 2001 ACS
TI   Imparting Biomimetic Ion-Gating Recognition Properties to Electrodes with
     a Hydrogen-Bonding Structured Core-Shell Nanoparticle
     Network
```

L4 ANSWER 4 OF 10 CA COPYRIGHT 2001 ACS
TI Functionalized **nanocrystals** and their use in detection systems

L4 ANSWER 5 OF 10 CA COPYRIGHT 2001 ACS
TI Water-soluble fluorescent semiconductor **nanocrystals**

L4 ANSWER 6 OF 10 CA COPYRIGHT 2001 ACS
TI Organo luminescent semiconductor **nanocrystal** probes for biological applications and process for making and using such probes

L4 ANSWER 7 OF 10 CA COPYRIGHT 2001 ACS
TI Structures and Properties of Nanoparticle Thin Films Formed via a One-Step Exchange-Cross-**Linking**-Precipitation Route

L4 ANSWER 8 OF 10 CA COPYRIGHT 2001 ACS
TI Self-assembled thin films on electrodes from thiolate-encapsulated gold **nanocrystals**

L4 ANSWER 9 OF 10 CA COPYRIGHT 2001 ACS
TI Electrode nanomaterials self-assembled from thiolate-encapsulated gold **nanocrystals**

L4 ANSWER 10 OF 10 CA COPYRIGHT 2001 ACS
TI **Nanocrystals** of II-VI semiconductor materials

=> d all 1-10

L4 ANSWER 1 OF 10 CA COPYRIGHT 2001 ACS
AN 133:273236 CA
TI **Core-Shell** Gold Nanoparticle Assembly as Novel Electrocatalyst of CO Oxidation
AU Maye, Mathew M.; Lou, Yongbing; Zhong, Chuan-Jian
CS Department of Chemistry, State University of New York at Birmingham, Birmingham, NY, USA
SO Langmuir (2000), 16(19), 7520-7523
CODEN: LANGD5; ISSN: 0743-7463
PB American Chemical Society
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 67
AB This paper reports findings of a study of the electrocatalytic oxidn. of CO that occurs at **nanocrystal** gold **cores** with thiolate monolayer encapsulation and within a **core-shell** network assembly. The **core-shell** and network combinations allow the manipulation of **core** size properties and enhance the stability of nanosized catalysts against the propensity of aggregation while being catalytically active. Using alkanedithiolate-**linked** thin films assembled from two different gold **core** sizes (2 and 5 nm), the capped nanosites are both electrochem. accessible and catalytically active to CO oxidn. upon electrochem. activation. Cyclic voltammetric data are presented for assessing the electrocatalytic properties. The results have important implications for the design and tailoring of nanosized gold catalysts via manipulating **core-shell** chem.
ST **core shell** gold nanoparticle assembly electrocatalyst

carbon monoxide oxidn; alkanedithiolate capped **linked** gold nanoparticle electrocatalyst carbon monoxide oxidn

IT Nanoparticles
(**core-shell** gold nanoparticle assembly as novel electrocatalyst of CO oxidn.)

IT Thiols (organic), uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(dithiols; gold nanoparticle capped and **linked** by alkanedithiols for electrocatalyst for CO oxidn.)

IT Oxidation catalysts
(electrochem.; **core-shell** gold nanoparticle assembly for CO)

IT Thiols (organic), uses
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(**nanocrystal** gold **cores** with thiolate monolayer encapsulation for electrocatalyst for CO oxidn.)

IT Cyclic voltammetry
(of gold nanoparticles with nonanedithiol coated on glassy carbon electrode in KOH with and without satn. by CO)

IT 7440-57-5, Gold, uses
RL: CAT (Catalyst use); PRP (Properties); USES (Uses)
(**core-shell** gold nanoparticle assembly as novel electrocatalyst of CO oxidn.)

IT 630-08-0, Carbon monoxide, properties
RL: PRP (Properties); RCT (Reactant)
(**core-shell** gold nanoparticle assembly as novel electrocatalyst of CO oxidn.)

IT 1310-58-3, Potassium hydroxide (KOH), uses
RL: NUU (Nonbiological use, unclassified); PRP (Properties); USES (Uses)
(cyclic voltammetry of gold nanoparticles with nonanedithiol coated on glassy carbon electrode in KOH with and without satn. by CO)

IT 3489-28-9, 1,9-Nonanedithiol
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(gold nanoparticle capped and **linked** by nonanedithiol for electrocatalyst for CO oxidn.)

IT 143-10-2, Decanethiol
RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(**nanocrystal** gold **cores** with thiolate monolayer encapsulation for electrocatalyst for CO oxidn.)

RE.CNT 44
RE

(1) Ahmadi, T; Science 1996, V272, P1924 CA
(2) Andres, R; Science 1996, V273, P1690 CA
(3) Bethell, D; J Electroanal Chem 1996, V409, P137 CA
(4) Biswas, P; J Electroanal Chem 1995, V381, P167 CA
(5) Bond, G; Catal Rev 1999, V41, P319 CA
(6) Brust, M; Adv Mater 1995, V7, P795 CA
(7) Brust, M; J Chem Soc, Chem Commun 1994, P801 CA
(8) Brust, M; J Chem Soc, Chem Commun 1995, P1655 CA
(9) Brust, M; Langmuir 1998, V14, P5425 CA
(10) Burke, L; Gold Bull 1998, V31, P39 CA
(11) Burke, L; J Electroanal Chem 1986, V210, P69 CA
(12) Edens, G; J Phys Chem 1996, V100, P2322 CA
(13) Edens, G; J Phys Chem 1996, V100, P2322 CA
(14) Elghanian, R; Science 1997, V277, P1078 CA
(15) Finklea, H; Langmuir 1987, V3, P409 CA

(16) Flatgen, G; Electrochim Acta 1999, V44, P4499 CA
(17) Freeman, R; Science 1995, V267, P17
(18) Freund, H; Faraday Discuss 1999, V114, P1 CA
(19) Haruta, M; Catal Today 1997, V36, P153 CA
(20) Hepel, M; J Electrochem Soc 1998, V145, P124 CA
(21) Herrero, E; J Phys Chem 1994, V98, P5074 CA
(22) Hoetetler, M; Langmuir 1998, V14, P17
(23) Hostetler, M; J Am Chem Soc 1996, V118, P4212 CA
(24) Hostetler, M; J Am Chem Soc 1998, V120, P9396 CA
(25) Hostetler, M; Langmuir 1999, V15, P3782 CA
(26) Ingram, R; Langmuir 1998, V14, P4115 CA
(27) Jarvi, T; J Phys Chem B 1998, V101, P3649
(28) Kita, H; J Electroanal Chem 1985, V190, P141 CA
(29) Kozlov, A; Appl Catal, A 1999, V182, P9 CA
(30) Leibowitz, F; Anal Chem 1999, V71, P5076 CA
(31) Li, H; Langmuir 1999, V15, P4957 CA
(32) Lipkowski, J; Electrocatalysis, Frontiers in Electrochemistry 1997, V5
(33) Maye, M; J Mater Chem 2000, V10, P1895 CA
(34) Maye, M; Langmuir 2000, V16, P490 CA
(35) Nishimura, K; J Electroanal Chem 1989, V260, P167 CA
(36) Orozco, G; Langmuir 1998, V14, P6297 CA
(37) Ron, H; Langmuir 1994, V10, P4566 CA
(38) Sun, N; J Am Chem Soc 1999, V121, P5587 CA
(39) Sun, S; J Phys Chem B 1999, V103, P2460 CA
(40) Tateishi, N; J Electroanal Chem 1993, V352, P243 CA
(41) Templeton, A; Acc Chem Res 2000, V33, P27 CA
(42) Valden, M; Science 1998, V281, P1647 CA
(43) Zhao, M; Adv Mater 1999, V11, P217 CA
(44) Zhong, C; Electrochem Commun 1999, V1, P72 CA

L4 ANSWER 2 OF 10 CA COPYRIGHT 2001 ACS
AN 133:234721 CA
TI Semiconductor **nanocrystal** probes for biological applications
IN Weiss, Shimon; Bruchez, Marcel; Alvisatos, Paul
PA The Regents of the University of California, USA
SO PCT Int. Appl., 71 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM G01N033-58
ICS G01N033-542; C12Q001-68; G01N033-533
CC 9-1 (Biochemical Methods)
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000055631	A1	20000921	WO 2000-US5257	20000228
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6207392	B1	20010327	US 1999-259982	19990301
PRAI	US 1999-259982	A	19990301		
	US 1997-978450	A2	19971125		

AB A semiconductor **nanocrystal** compd. capable of **linking** to one or more affinity mols. comprises (1) one or more semiconductor

nanocrystals capable of, in response to exposure to a first energy, providing a second energy, and (2) one or more **linking** agents, having a first portion **linked** to the one or more semiconductor **nanocrystals** and a second portion capable of **linking** to one or more affinity mols. Also disclosed are one or more of semiconductor **nanocrystal** compds. **linked** to one or more affinity mols. to form a semiconductor **nanocrystal** probe capable of bonding with one or more detectable substances in a material being analyzed, and are capable of, in response to exposure to a first energy, providing a second energy. The probe is capable of emitting electromagnetic radiation in a narrow wavelength band and/or absorbing, scattering, or diffracting energy when excited by an electromagnetic radiation source of narrow or broad bandwidth, or a particle beam. The probe is stable to repeated exposure to energy in the presence of oxygen and/or other radicals.

ST semiconductor **nanocrystal** probe

IT Coupling agents
(for coupling affinity mols. to **nanocrystal**; semiconductor **nanocrystal** probes for biol. applications)

IT Proteins, specific or class
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(immobilized; semiconductor **nanocrystal** probes for biol. applications)

IT Nucleic acids
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(labeled; semiconductor **nanocrystal** probes for biol. applications)

IT Affinity
Analysis
Bioassay
Biosensors
Energy transfer
Nanocrystals
Nucleic acid hybridization
Semiconductor compounds
Semiconductor materials
(semiconductor **nanocrystal** probes for biol. applications)

IT Nucleic acids
RL: ANT (Analyte); ANST (Analytical study)
(semiconductor **nanocrystal** probes for biol. applications)

IT Probes (nucleic acid)
RL: ARG (Analytical reagent use); ANST (Analytical study); USES (Uses)
(semiconductor **nanocrystal** probes for biol. applications)

IT Molecules
(small, as affinity mols. on probes; semiconductor **nanocrystal** probes for biol. applications)

IT 1306-23-6, Cadmium sulfide (CdS), reactions 1314-98-3, Zinc sulfide, reactions 12442-27-2, Cadmium zinc sulfide ((Cd,Zn)S)
RL: RCT (Reactant)
(CdSe **nanocrystals** coated with, silica coating of; semiconductor **nanocrystal** probes for biol. applications)

IT 78-50-2
RL: DEV (Device component use); RCT (Reactant); USES (Uses)
(CdSe/CdS **core/shell nanocrystals** coated with, mercaptobenzoic acid reaction with; semiconductor **nanocrystal** probes for biol. applications)

IT 12626-36-7, Cadmium selenide sulfide (Cd(Se,S))
RL: DEV (Device component use); RCT (Reactant); USES (Uses)
(**core/shell nanocrystals**, coated with

trisoctylphosphine oxide, mercaptobenzoic acid reaction with; semiconductor **nanocrystal** probes for biol. applications)
IT 1306-24-7, Cadmium selenide (CdSe), reactions
RL: DEV (Device component use); RCT (Reactant); USES (Uses)
(**nanocrystals**, silica coating of; semiconductor **nanocrystal** probes for biol. applications)
IT 75-77-4, Chlorotrimethylsilane, reactions 1074-36-8, (4-Mercapto)benzoic acid 4420-74-0, 3-(Mercaptopropyl)trimethoxysilane 13822-56-5, 3-Aminopropyltrimethoxysilane 84962-98-1
RL: RCT (Reactant)
(semiconductor **nanocrystal** probes for biol. applications)
RE.CNT 7
RE
(1) Bruchez, M; US 5990479 A 1999 CA
(2) Bruchez, M; SCIENCE 1998, V281(281), P2013
(3) Chan, W; SCIENCE 1998, V281(281), P2016
(4) Dabbousi, B; JOURNAL OF PHYSICAL CHEMISTRY B 1997, V101(46), P9463 CA
(5) Lacoste, T; BIOPHYSICAL JOURNAL 2000, V78, P402A
(6) Massachusetts Inst Technology; EP 0990903 A 2000 CA
(7) Univ Northwestern; WO 9804740 A 1998 CA

L4 ANSWER 3 OF 10 CA COPYRIGHT 2001 ACS
AN 133:39997 CA
TI Imparting Biomimetic Ion-Gating Recognition Properties to Electrodes with a Hydrogen-Bonding Structured **Core-Shell** Nanoparticle Network
AU Zheng, Wenxia; Maye, Mathew M.; Leibowitz, Frank L.; Zhong, Chuan-Jian
CS Department of Chemistry, State University of New York at Binghamton, Binghamton, NY, 13902, USA
SO Anal. Chem. (2000), 72(10), 2190-2199
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
CC 9-1 (Biochemical Methods)
Section cross-reference(s): 6, 76
AB This paper presents findings of the creation of biomimetic ion-gating properties with **core-shell** nanoparticle network architectures. The architectures were formed by hydrogen-bonding **linkages** via an exchange-crosslinking-pptn. reaction pathway using gold nanoparticles capped with thiolate **shell** and alkylthiols terminated with carboxylic groups as model building blocks. Such network assemblies have open frameworks in which void space is in the form of a channel or chamber with the nanometer-sized **cores** defining its size, the geometric arrangement defining its shape, and the **shell** structures defining its chem. specificity. The formation of the network **linkages** via head-to-head hydrogen-bonded carboxylic terminals and the reversible pH-tuned structural properties between neutral and ionic states were characterized using IR reflectance spectroscopic technique. The biomimetic ion-gating properties were demonstrated by measuring the pH-tuned network "open-close" responses to charged redox probes. Such redox responses were shown to depend on the degree of protonation-deprotonation of carboxylic groups at the interparticle **linkages**, **core** sizes of the nanoparticles, and charges of the redox probes. Differences in structural networking, pH-tuning, and electrochem. gating properties were identified between the network films derived from nanoparticles of two different **core** sizes (2 and 5 nm). The mechanistic correlation of these structural properties was discussed.

These findings have added a new pathway to the current approaches to biomimetic mol. recognition via design of **core-shell** nanoparticle architectures at both **nanocrystal** and mol. scales.

ST ion gating nanoparticle network biomimetic electrode gold mercaptoundecanoic acid

IT Electric current
(biol., gating; imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network)

IT Carboxyl group
Cations
Electrodes
Hydrogen bond
Nanoparticles
(imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network)

IT Thiols (organic), biological studies
RL: BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC
(Process); USES (Uses)
(imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network)

IT Ion channel
RL: BSU (Biological study, unclassified); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC (Process)
(imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network)

IT 71310-21-9, 11-Mercaptoundecanoic acid
RL: BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC
(Process); USES (Uses)
(imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network)

IT 7440-57-5, Gold, biological studies
RL: BSU (Biological study, unclassified); DEV (Device component use); PEP (Physical, engineering or chemical process); BIOL (Biological study); PROC
(Process); USES (Uses)
(nanoparticle; imparting biomimetic ion-gating recognition properties to electrodes with a hydrogen-bonding structured **core-shell** nanoparticle network)

RE.CNT 66

RE

(1) Alvarez, M; J Phys Chem B 1997, V101, P3706 CA
(2) Amatore, C; J Electroanal Chem 1983, V147, P39 CA
(3) Anon; Nanoparticles and Nanostructured Films 1998
(4) Bain, C; J Am Chem Soc 1989, V111, P321 CA
(5) Bethell, D; J Electroanal Chem 1996, V409, P137 CA
(6) Bilewicz, R; Langmuir 1995, V11, P2256 CA
(7) Brown, C; Anal Chem 1998, V70, P2991 CA
(8) Brust, M; Adv Mater 1995, V7, P795 CA
(9) Brust, M; J Chem Soc, Chem Commun 1994, P801 CA
(10) Brust, M; J Chem Soc, Chem Commun 1995, P1655 CA
(11) Brust, M; Langmuir 1998, V14, P5425 CA

(12) Bryant, M; Langmuir 1993, V9, P385 CA
(13) Buhlmann, P; Electroanalysis 1998, V10, P1149
(14) Chailapakul, O; Langmuir 1995, V11, P1329 CA
(15) Chen, S; Science 1998, V280, P2098 CA
(16) Crooks, R; Acc Chem Res 1998, V31, P219 CA
(17) Demaille, C; Anal Chem 1997, V69, P2323 CA
(18) Doblhofer, K; Electrochim Acta 1988, V33, P453 CA
(19) Elghanian, R; Science 1997, V277, P1078 CA
(20) Finklea, H; Langmuir 1993, V9, P3660 CA
(21) Flink, S; J Am Chem Soc 1998, V120, P4652 CA
(22) Freeman, R; Science 1995, V267, P17
(23) Goldenberg, L; J Mater Chem 1999, V9, P1957 CA
(24) Han, L; Manuscript in preparation
(25) Hayashi, S; J Chem Phys 1975, V63, P1732 CA
(26) Hoetetler, M; Langmuir 1998, V14, P17
(27) Hostetler, M; Curr Opin Colloid Interface Sci 1997, V2, P42 CA
(28) Hostetler, M; J Am Chem Soc 1996, V118, P4212 CA
(29) Hostetler, M; J Am Chem Soc 1998, V120, P9396 CA
(30) Hostetler, M; Langmuir 1999, V15, P3782 CA
(31) Hu, K; Chem Mater 1998, V10, P1160 CA
(32) Hu, K; Langmuir 1997, V13, P5114 CA
(33) Johnson, S; Langmuir 1998, V14, P6639 CA
(34) Johnson, S; Science 1999, V283, P963 CA
(35) Kepley, L; Anal Chem 1992, V64, P3191 CA
(36) Kiely, C; Nature 1998, V396, P444 CAPLUS
(37) Lee, T; Langmuir 1994, V10, P741 CA
(38) Leibowitz, F; Anal Chem 1999, V71, P5076 CA
(39) Li, M; Chem Mater 1999, V11, P23 CA
(40) Liu, Y; J Am Chem Soc 1997, V119, P8720 CA
(41) Mallouk, T; Acc Chem Res 1998, V31, P209 CA
(42) Martin, C; Anal Chem 1998, V70, P322A CA
(43) Maye, M; Langmuir 2000, V16, P490 CA
(44) Mucic, R; J Am Chem Soc 1998, V120, P12674 CA
(45) Murray, R; Electroanalytical Chemistry 1984, V13, P191 CA
(46) Musick, M; Langmuir 1999, V15, P844 CA
(47) Nuzzo, R; J Am Chem Soc 1990, V112, P558 CA
(48) Rojas, M; J Am Chem Soc 1995, V117, P336 CA
(49) Royal Society of Chemistry; Membrane and Molecular Assemblies: The Synkinetic Approach 1994, P149
(50) Russell, V; Science 1997, V276, P575 CA
(51) Schierbaum, K; Science 1994, V265, P1413 CA
(52) Shipway, A; Chem Mater 1999, V11, P13 CA
(53) Smalley, J; J Phys Chem B 1999, V103, P1676 CA
(54) Smith, C; Langmuir 1993, V9, P0743
(55) Smith, E; J Phys Chem 1993, V97, P8032 CA
(56) Smith, E; Langmuir 1992, V8, P2707 CA
(57) Steinberg, S; J Am Chem Soc 1991, V113, P5176 CA
(58) Tao, Y; J Phys Chem B 1997, V101, P9732 CA
(59) Umemura, J; J Chem Phys 1978, V1, P42
(60) Weisbecker, C; Langmuir 1996, V12, P3763 CA
(61) White, H; J Phys Chem B 1998, V102, P2930 CA
(62) Xiao, K; Anal Chem 1999, V71, P1183 CA
(63) Yaghi, O; Access in Nanoporous Materials 1995, P111 CA
(64) Zheng, W; Analyst 2000, V125, P17 CA
(65) Zheng, W; unpublished work
(66) Zhong, C; Chem Commun 1999, V13, P1211

L4 ANSWER 4 OF 10 CA COPYRIGHT 2001 ACS
AN 132:331662 CA
TI Functionalized **nanocrystals** and their use in detection systems

IN Barbera-guillem, Emilio; Castro, Stephanie
PA Biocrystal Limited, USA
SO PCT Int. Appl., 46 pp.
CODEN: PIXXD2
DT Patent
LA English
IC A61K009-16; B32B005-16; F21V009-16; G01J003-30; G01N021-64; G01N023-02; G01N023-223; G01N033-533
CC 9-1 (Biochemical Methods)
Section cross-reference(s): 78, 79, 80
FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000027365	A1	20000518	WO 1999-US26487	19991110
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6221602	B1	20010424	US 1999-436159	19991109
	WO 2000028089	A1	20000518	WO 1999-US26616	19991110
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
PRAI	US 1998-109626	P	19981124		
	US 1998-107828	P	19981110		
	US 1998-107829	P	19981110		

AB Provided are compns. comprising water-sol., functionalized **nanocrystals**. The water-sol. functionalized **nanocrystals** comprise quantum dots capped with a layer of a capping compd., and further comprise, by operably **linking** and in a successive manner, one or more addnl. compds. Preferably, an addnl. compd. comprises diaminocarboxylic acid which is operatively **linked** to the capping compd., and may further comprise an amino acid, and affinity ligand, or a combination thereof. Also provided are methods of using the functionalized **nanocrystals** having an affinity ligand to detect the presence or absence of a target substrate in a sample by contacting the functionalized **nanocrystals** with the sample so that complexes are formed between the functionalized **nanocrystals** and substrate, if the substrate is present; exposing the complexes in the detection system to an excitation light source, and detecting the emitted fluorescence peak. Quantum dot functionalized **nanocrystals** having a CdSe **core**, a ZnS **shell**, and mercaptoacetic acid capping, were activated with EDC and sulfo-NHS and reacted with wheat germ agglutinin. The **nanocrystals** were then used to fluorescently detect Met-129 cancer cells.

ST functionalized **nanocrystal** sensor; quantum dot **nanocrystal** agglutinin cancer cell fluorescence

IT Animal cell line
(Met-129 cell, fluorescent staining of, with **nanocrystals** contg. wheat germ agglutinin; functionalized **nanocrystals** and use in detection systems)
IT Ligands
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(affinity; functionalized **nanocrystals** and use in detection systems)
IT Amino acids, uses
RL: DEV (Device component use); USES (Uses)
(diamino; functionalized **nanocrystals** and use in detection systems)
IT Cytometry
(flow; functionalized **nanocrystals** and use in detection systems)
IT Analytical apparatus
Fluorescence microscopy
Fluorometry
Nanocrystals
Nucleic acid hybridization
Quantum dot devices
(functionalized **nanocrystals** and use in detection systems)
IT Avidins
Nucleic acids
Peptides, uses
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(functionalized **nanocrystals** and use in detection systems)
IT Agglutinins and Lectins
RL: ARG (Analytical reagent use); DEV (Device component use); RCT (Reactant); ANST (Analytical study); USES (Uses)
(functionalized **nanocrystals** and use in detection systems)
IT Amino acids, uses
RL: DEV (Device component use); USES (Uses)
(functionalized **nanocrystals** and use in detection systems)
IT Carboxylic acids, uses
RL: DEV (Device component use); USES (Uses)
(mercapto, as capping compd. of **nanocrystal**; functionalized **nanocrystals** and use in detection systems)
IT Antibodies
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(monoclonal; functionalized **nanocrystals** and use in detection systems)
IT Molecules
(sorting of; functionalized **nanocrystals** and use in detection systems)
IT 1306-24-7, Cadmium selenide (CdSe), uses
RL: DEV (Device component use); USES (Uses)
(as **core** of **nanocrystal**; functionalized **nanocrystals** and use in detection systems)
IT 1314-98-3, Zinc sulfide, uses
RL: DEV (Device component use); USES (Uses)
(as **shell** of **nanocrystal**; functionalized **nanocrystals** and use in detection systems)
IT 9013-20-1, Streptavidin
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(functionalized **nanocrystals** and use in detection systems)

IT 52-90-4, Cysteine, uses 56-12-2, .gamma.-Aminobutyric acid, uses 56-40-6, Glycine, uses 56-45-1, Serine, uses 56-85-9, Glutamine, uses 70-26-8, Ornithine 70-47-3, Asparagine, uses 72-19-5, Threonine, uses 74-79-3, Arginine, uses 107-95-9, .beta.-Alanine 305-62-4, 2,4-Diaminobutyric acid 372-75-8, Citrulline 498-59-9, Djenkolic acid 515-94-6, 2,3-Diaminopropionic acid 583-93-7, 2,6-Diaminopimelic acid 616-07-9, Ornithine 619-05-6, 3,4-Diaminobenzoic acid 672-15-1, Homoserine 923-01-3, .beta.-Cyanoalanine 1190-94-9, 5-Hydroxylysine 6027-13-0, Homocysteine
RL: DEV (Device component use); USES (Uses)
(functionalized **nanocrystals** and use in detection systems)

IT 56-87-1, Lysine, reactions
RL: DEV (Device component use); RCT (Reactant); USES (Uses)
(functionalized **nanocrystals** and use in detection systems)

IT 68-11-1, Mercaptoacetic acid, reactions 78-50-2, TOPO 506-82-1, Dimethyl cadmium 557-20-0, Diethyl zinc 1892-57-5, 1-Ethyl-3-(dimethylaminopropyl)carbodiimide 3385-94-2, Hexamethyldisilathiane 20612-73-1 82436-78-0
RL: RCT (Reactant)
(in **nanocrystal** prepn.; functionalized **nanocrystals** and use in detection systems)

RE.CNT 5
RE
(1) Egawa; JP 11087689 A 1999 CA
(2) Gallagher; US 5525377 A 1996 CA
(3) Lawandy; US 5882779 A 1999 CA
(4) Lawandy; US 5908608 A 1999 CA
(5) Weiss; US 5990479 A 1999 CA

L4 ANSWER 5 OF 10 CA COPYRIGHT 2001 ACS
AN 132:233974 CA
TI Water-soluble fluorescent semiconductor **nanocrystals**
IN Bawendi, Moungi G.; Mikulec, Frederick V.; Lee, Jin-Kyu
PA Massachusetts Institute of Technology, USA
SO PCT Int. Appl., 55 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM G01N033-58
ICS H05B033-10
CC 9-1 (Biochemical Methods)
FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000017655	A1	20000330	WO 1999-US21375	19990917
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6251303	B1	20010626	US 1998-156863	19980918
	AU 9961485	A1	20000410	AU 1999-61485	19990917
	EP 1116036	A1	20010718	EP 1999-948273	19990917
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
PRAI	US 1998-156863	A	19980918		

	US 1998-100947	P	19980918
	US 1998-101046	P	19980918
	US 1998-160454	A	19980924
	US 1998-160458	A	19980924
	US 1999-397428	A	19990917
	US 1999-397432	A	19990917
	US 1999-397436	A	19990917
	WO 1999-US21375	W	19990917

AB A water-sol. semiconductor **nanocrystal** capable of light emission is provided. The **nanocrystal** including a semiconductor **nanocrystal core** having a selected band gap energy, a **shell** layer overcoating the **core** comprised of a semiconductor material having a band gap energy greater than that of the semiconductor **nanocrystal**, and an outer layer comprised of a mol. having at least one **linking** group for attachment of the mol. to the overcoating **shell** layer and at least one hydrophilic group optionally spaced apart from the **linking** group by a hydrophobic region sufficient to prevent electron charge transfer across the hydrophobic region. A typical formula is: H2X((CH2)nCO2H)y or its salt, where X = first portion the ligand, S, N, P, O=P; n .gtoreq. 6; z and y are selected to satisfy the valence requirements of X; other ligands composed of various org. groups are used as well.

ST semiconductor **nanocrystal** fluorescence water soluble

IT Cytometry
(FACS (fluorescence-activated cell sorting); water-sol. fluorescent semiconductor **nanocrystals**)

IT Imaging
(fluorescent; water-sol. fluorescent semiconductor **nanocrystals**)

IT Immunoassay
(immunocytochem.; water-sol. fluorescent semiconductor **nanocrystals**)

IT Band gap
Biosensors
Fluorescent indicators
Hydrophilicity
Hydrophobicity
Immunoassay
Semiconductor materials
(water-sol. fluorescent semiconductor **nanocrystals**)

IT 58-85-5, Biotin 9013-20-1, Streptavidin
RL: ARG (Analytical reagent use); DEV (Device component use); ANST (Analytical study); USES (Uses)
(water-sol. fluorescent semiconductor **nanocrystals**)

IT 1303-00-0, Gallium arsenide (GaAs), uses 1303-11-3, Indium arsenide (InAs), uses 1306-19-0, Cadmium oxide (CdO), uses 1306-24-7, Cadmium selenide (CdSe), uses 1306-25-8, Cadmium telluride (CdTe), uses 1312-41-0, Antimony compd. with indium (1:1), uses 1313-04-8, Magnesium selenide (MgSe) 1314-13-2, Zinc oxide (ZnO), uses 1314-87-0, Lead sulfide (PbS) 1314-98-3, Zinc sulfide (ZnS), uses 1315-09-9, Zinc selenide (ZnSe) 1315-11-3, Zinc telluride (ZnTe) 1344-48-5, Mercury sulfide (HgS) 7440-56-4, Germanium, uses 9002-92-0 9005-00-9 12032-36-9, Magnesium sulfide (MgS) 12032-44-9, Magnesium telluride (MgTe) 12063-98-8, Gallium phosphide (GaP), uses 12064-03-8 12068-90-5, Mercury telluride (HgTe) 12069-00-0, Lead selenide (PbSe) 13149-86-5 20859-73-8, Aluminum phosphide (AlP) 21908-53-2, Mercury oxide (HgO) 22398-80-7, Indium phosphide (InP), uses 22831-42-1, Aluminum arsenide (AlAs) 24304-00-5, Aluminum nitride (AlN) 25152-52-7

25617-97-4, Gallium nitride (GaN) 25617-98-5, Indium nitride (InN)
RL: DEV (Device component use); USES (Uses)
(water-sol. fluorescent semiconductor **nanocrystals**)
IT 7782-49-2, Selenium, reactions
RL: DEV (Device component use); RCT (Reactant); USES (Uses)
(water-sol. fluorescent semiconductor **nanocrystals**)
IT 78-50-2, TOPO 506-82-1, Dimethyl cadmium 557-20-0, Diethyl zinc
3385-94-2, Hexamethyldisilathiane 4731-53-7, Trioctylphosphine
RL: RCT (Reactant)
(water-sol. fluorescent semiconductor **nanocrystals**)
IT 20612-73-1P, Trioctylphosphine selenide
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)
(water-sol. fluorescent semiconductor **nanocrystals**)
RE.CNT 4
RE
(1) Chan, W; SCIENCE 1998, V281(5385), P2016 CA
(2) Dabbousi, B; JOURNAL OF PHYSICAL CHEMISTRY B, MATERIALS, SURFACES, INTERFACES AND BIOPHYSICAL V101(46), P9463 CA
(3) Lawless, D; JOURNAL OF PHYSICAL CHEMISTRY 1995, V99, P10329 CA
(4) Paul, A; US 5751018 A 1998 CA

L4 ANSWER 6 OF 10 CA COPYRIGHT 2001 ACS
AN 131:348775 CA
TI Organo luminescent semiconductor **nanocrystal** probes for biological applications and process for making and using such probes
IN Weiss, Shimon; Bruchez, Marcel, Jr.; Alivisatos, Paul
PA Regents of the University of California, USA
SO U.S., 13 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM G01N001-30
ICS G01N021-63
NCL 250307000
CC 9-5 (Biochemical Methods)
Section cross-reference(s): 29, 79, 80
FAN.CNT 3

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5990479	A	19991123	US 1997-978450	19971125
	US 6207392	B1	20010327	US 1999-259982	19990301
	JP 2000275180	A2	20001006	JP 1999-80598	19990324
PRAI	US 1997-978450	A2	19971125		

AB A luminescent semiconductor **nanocrystal** compd. is described which is capable of **linking** to an affinity mol. The compd. comprises (1) a semiconductor **nanocrystal** capable of emitting electromagnetic radiation (luminescing) in a narrow wavelength band and/or absorbing energy, and/or scattering or diffracting electromagnetic radiation--when excited by an electromagnetic radiation source (of narrow or broad bandwidth) or a particle beam; and (2) at least one **linking** agent, having a first portion **linked** to the semiconductor **nanocrystal** and a second portion capable of **linking** to an affinity mol. The luminescent semiconductor **nanocrystal** compd. is **linked** to an affinity mol. to form an organo luminescent semiconductor **nanocrystal** probe capable of bonding with a detectable substance in a material being analyzed, and capable of emitting electromagnetic radiation in a narrow wavelength band and/or absorbing, scattering, or diffracting energy when excited by an electromagnetic radiation source (of narrow or broad bandwidth) or a

particle beam. The probe is stable to repeated exposure to light in the presence of oxygen and/or other radicals. Further described is a process for making the luminescent semiconductor **nanocrystal** compd. and for making the organo luminescent semiconductor **nanocrystal** probe comprising the luminescent semiconductor **nanocrystal** compd. **linked** to an affinity mol. capable of bonding to a detectable substance. A process is also described for using the probe to det. the presence of a detectable substance in a material. 4-Mercaptobenzoic acid at pH 10 was reacted with trisocylphosphine oxide-coated CdSe/CdS **core/shell nanocrystals**

ST organo luminescent semiconductor **nanocrystal** probe biol analysis; **linking** agent luminescent semiconductor **nanocrystal**

IT Biological materials
(anal. of; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT Inorganic compounds
Organic compounds, analysis
RL: ANT (Analyte); ANST (Analytical study)
(anal. of; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT Glass, uses
RL: DEV (Device component use); USES (Uses)
(as coating on semiconductor **nanocrystal**; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT Coating materials
(glass, on semiconductor **nanocrystal**; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT Affinity labeling
Analysis
Luminescence spectroscopy
Luminescent substances
Nanocrystals
Scanning electron microscopy
Semiconductor materials
Transmission electron microscopy
X-ray
X-ray diffractometry
(organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT X-ray spectroscopy
(scattering; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT 1306-24-7, Cadmium selenide (CdSe), uses
RL: DEV (Device component use); USES (Uses)
(CdS and, **core/shell nanocrystals** of; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT 1306-23-6, Cadmium sulfide (CdS), uses
RL: DEV (Device component use); USES (Uses)
(CdSe and, **core/shell nanocrystals** of; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT 78-50-2

RL: DEV (Device component use); USES (Uses)
(CdSe/CdS **core/shell nanocrystals** coated with, **linking** agent binding to; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT 7631-86-9, Silica, uses
RL: DEV (Device component use); USES (Uses)
(as coating on semiconductor **nanocrystal**; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

IT 75-77-4, Chlorotrimethylsilane, reactions 1074-36-8, 4-Mercaptobenzoic acid 4420-74-0, 3-Mercaptopropyltrimethoxysilane 13822-56-5, Aminopropyltrimethoxysilane 23843-64-3
RL: RCT (Reactant)
(in prepn. of luminescent semiconductor **nanocrystals**; organo luminescent semiconductor **nanocrystal** probes for biol. applications and process for making and using such probes)

RE.CNT 8
RE
(1) Alivisatos; US 5262357 1993 CA
(2) Alivisatos; US 5505928 1996 CA
(3) Alivisatos; US 5537000 1996 CA
(4) Alivisatos; US 5751018 1998 CA
(5) Dabbousi, B; Journal of Physical Chemistry B 1997, V101, P9463 CA
(6) Hinshaw; US 4637988 1987 CA
(7) Miyakawa; US 5319209 1994 CA
(8) Peng, X; Journal of the American Chemical Society V119(30), P7019 CA

L4 ANSWER 7 OF 10 CA COPYRIGHT 2001 ACS
AN 131:304484 CA
TI Structures and Properties of Nanoparticle Thin Films Formed via a One-Step Exchange-Cross-**Linking**-Precipitation Route
AU Leibowitz, Frank L.; Zheng, Wenxia; Maye, Mathew M.; Zhong, Chuan-Jian
CS Department of Chemistry, State University of New York at Binghamton, Binghamton, NY, 13902, USA
SO Anal. Chem. (1999), 71(22), 5076-5083
CODEN: ANCHAM; ISSN: 0003-2700
PB American Chemical Society
DT Journal
LA English
CC 72-2 (Electrochemistry)
AB The structural and electrochem. properties of nanoparticle thin films derived by a one-step exchange-crosslinking-pptn. route were characterized. While there exists a stepwise layer-by-layer construction method, the motivation stems from seeking an alternative and simpler pathway to prep. such thin films as electrode nanomaterials. The model system consisting of thiolate-encapsulated gold **nanocrystals** and .alpha.,.omega.-alkanedithiol cross-**linkers** was studied. The mixing of these 2 components in solns. allowed sequential exchanging, crosslinking, and eventual pptn. of the dithiol-cross-**linked nanocrystals** as thin films on almost any substrates. A series of comparative microscopic, spectroscopic, and electrochem. analyses were performed on thin films derived from **nanocrystals** of 2- and 5-nm **core** sizes. The 5-nm particles were fabricated by size and shape evolution of preformed 2-nm particles. The films were specularly reflecting, electronically continuous, and remarkably comparable with stepwise-derived thin films in structural, electronic, and electrochem. properties. The electrochem. data were discussed in terms of thiolate binding and barrier properties of the **core-shell**

structures, which may have potential chem. recognition applications.

ST gold nanoparticle film pptn alkanedithiol crosslinker structural electrochem property

IT Thiols (organic), uses
RL: NUU (Nonbiological use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(dithiols, cross-**linkers**; structural and electrochem. properties of thiolate-encapsulated Au **nanocrystal** films derived by exchange-crosslinking-pptn. route using)

IT Nanoparticles
(films; structural and electrochem. properties of thiolate-encapsulated Au **nanocrystal** films derived by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

IT Cyclic voltammetry
Microstructure
Stretching vibration
Thickness
(of thiolate-encapsulated Au **nanocrystal** films derived by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

IT Precipitation (chemical)
(prepn. of thiolate-encapsulated Au **nanocrystal** films by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

IT Films
(structural and electrochem. properties of thiolate-encapsulated Au **nanocrystal** films derived by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

IT 928-98-3, 1,5-Pentanedithiol 1191-08-8, 1,4-Butanedithiol 3489-28-9, 1,9-Nonanedithiol
RL: NUU (Nonbiological use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(cross-**linker**; structural and electrochem. properties of thiolate-encapsulated Au **nanocrystal** films derived by exchange-crosslinking-pptn. route using)

IT 109-79-5, Butanethiol 143-10-2, Decanethiol 1322-36-7, Dodecanethiol 2885-00-9, Octadecylthiol
RL: PEP (Physical, engineering or chemical process); PROC (Process)
(in prepn. of thiolate-encapsulated Au **nanocrystal** films by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

IT 16903-35-8, Hydrogentetrachloroaurate 16940-66-2, Sodium borohydride
RL: RCT (Reactant)
(in prepn. of thiolate-encapsulated Au **nanocrystal** films by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

IT 7440-57-5, Gold, properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(structural and electrochem. properties of thiolate-encapsulated Au **nanocrystal** films derived by exchange-crosslinking-pptn. route using .alpha.,.omega.-alkanedithiol cross-**linkers**)

RE.CNT 47

RE

(1) Andres, R; Science 1996, V273, P1690 CA
(2) Anon; Nanoparticles in Solids and Solution 1996, V18
(3) Bethell, D; J Electroanal Chem 1996, V409, P137 CA
(4) Brouers, F; Phys Rev B 1993, V47, P666 CA
(5) Brown, L; J Am Chem Soc 1997, V119, P12384 CA

(6) Brust, M; Adv Mater 1995, V7, P795 CA
(7) Brust, M; J Chem Soc Chem Commun 1994, P801 CA
(8) Brust, M; J Chem Soc Chem Commun 1995, P1655 CA
(9) Brust, M; Langmuir 1998, V14, P4
(10) Chen, S; Science 1998, V280, P2098 CA
(11) Demaille, C; Anal Chem 1997, V69, P2323 CA
(12) Elghanian, R; Science 1997, V277, P1078 CA
(13) Fan, H; Langmuir 1997, V13, P119 CA
(14) Fendler, J; Chem Mater 1996, V8, P1616 CA
(15) Fink, J; Chem Mater 1998, V10, P922 CA
(16) Finklea, H; Electroanalytical Chemistry 1996, V19, P109 CA
(17) Foss, C; J Phys Chem 1994, V98, P2963 CA
(18) Freeman, R; Science 1995, V267, P17
(19) Giersig, G; Langmuir 1993, V9, P3408
(20) Heath, J; J Phys Chem B 1997, V101, P189 CA
(21) Hoetetler, M; Langmuir 1998, V14, P17
(22) Hostetler, M; Curr Opin Colloid Interface Sci 1997, V2, P42 CA
(23) Hostetler, M; J Am Chem Soc 1998, V120, P9396 CA
(24) Hostetler, M; Langmuir 1996, V12, P3604 CA
(25) Hostetler, M; Langmuir 1996, V12, P3604 CA
(26) Hu, K; Chem Mater 1998, V10, P1160 CA
(27) Keating, C; ACS Symp Ser 1997, V679, P7 CA
(28) Mannakos, S; Chem Mater 1998, V10, P1214
(29) Martin, C; Anal Chem 1998, V70, P322A CA
(30) Maye, M; to be published in Langmuir
(31) Mirkin, C; Nature 1996, V382, P607 CA
(32) Musick, M; Chem Mater 1997, V9, P1499 CA
(33) Musick, M; Langmuir 1999, V15, P844 CA
(34) Nie, S; Science 1997, V275, P1102 CA
(35) Peschel, S; Angew Chem Int Ed Engl 1995, V34, P1442 CA
(36) Schmid, G; Adv Mater 1998, V10, P515 CA
(37) Schneider, T; J Am Chem Soc 1993, V115, P12391 CA
(38) Snow, A; Chem Mater 1998, V10, P947 CA
(39) Terrill, R; J Am Chem Soc 1995, V117, P12537 CA
(40) Walczak, M; J Electroanal Chem 1995, V396, P103 CA
(41) Weisshaar, D; J Am Chem Soc 1992, V114, P5860 CA
(42) Weisshaar, D; Langmuir 1993, V9, P323 CA
(43) Whetten, R; Adv Mater 1996, V8, P428 CA
(44) Widrig, C; J Electroanal Chem 1991, V310, P335 CA
(45) Yang, D; J Electroanal Chem 1998, V441, P173 CA
(46) Zhao, M; Adv Mater 1999, V11, P217 CA
(47) Zoval, J; Anal Chem 1996, V68, P1585 CA

L4 ANSWER 8 OF 10 CA COPYRIGHT 2001 ACS
AN 131:93867 CA
TI Self-assembled thin films on electrodes from thiolate-encapsulated gold **nanocrystals**
AU Zhong, C. J.; Zheng, W. X.; Leibowitz, F. L.; Eichelburger, H.
CS Department of Chemistry, State University of New York at Binghamton, Binghamton, NY, 13902, USA
SO Proc. - Electrochem. Soc. (1999), 99-5(New Directions in Electroanalytical Chemistry II), 226-235
CODEN: PESODO; ISSN: 0161-6374
PB Electrochemical Society
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 66
AB The fabrication and characterization of nanometer-sized and

monolayer-encapsulated nanoparticles, a much-anticipated development of mol. self-assembly, are fascinating areas because interesting electronic, optical, magnetic, catalytic and sensing properties can emerge by manipulating structures at both the encapsulating **shell** and the particle **core**. Intriguing abilities of such structural manipulations to fine-tune individual nanoelectrodes or collective arrays constitute the motivation of this study. Narrow-sized and shaped gold **nanocrystals** encapsulated with decanethiolate monolayers were fabricated via unusual size and shape evolution during synthetic manipulations. These **nanocrystals** were assembled as thin films on electrode surfaces via exchange reaction between alkanethiolates encapsulated on the **nanocrystals** and .alpha.,.omega.-alkyldithiols in the soln. The preliminary electrochem. study of the thin film assembly revealed interesting parallels and differences between monolayers on planar and **nanocrystal** surfaces. These results may have implications to the correlation between the thiolate binding properties at **nanocrystal** facets and the barrier properties of monolayer-encapsulated **nanocrystals** as electrode nanomaterials.

ST self assembled thin film electrode thiolate encapsulated gold **nanocrystal**; decanethiol encapsulated gold **nanocrystal** electrode; nonanedithiol **linked** gold **nanocrystal** electrode

IT Thiols (organic), uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(electrodes from gold **nanocrystals** encapsulated with)

IT Monolayers
(nonanedithiol on gold electrodes)

IT Transmission electron microscopy
(of decanethiolate-encapsulated gold **nanocrystals**)

IT Electrodes
(planar; monolayers on **nanocrystal** vs. monolayers on)

IT Film electrodes
Nanocrystals
(self-assembled thin films on electrodes from thiolate-encapsulated gold **nanocrystals**)

IT 3489-28-9, 1,9-Nonanedithiol
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(cyclic voltammetry for nonanedithiol-**linked** gold **nanocrystal** and for nonanedithiol monolayer on unannealed and annealed gold in KOH soln.)

IT 1310-58-3, Potassium hydroxide (KOH), uses
RL: NUU (Nonbiological use, unclassified); PRP (Properties); USES (Uses)
(cyclic voltammetry for nonanedithiol-**linked** gold **nanocrystal** and for nonanedithiol monolayer on unannealed and annealed gold in KOH soln.)

IT 7440-06-4, Platinum, uses
RL: DEV (Device component use); PRP (Properties); USES (Uses)
(cyclic voltammetry on gold and nonanedithiol-**linked** gold **nanocrystal** and for nonanedithiol monolayer on gold and on platinum in potassium chloride soln.)

IT 7447-40-7, Potassium chloride, uses
RL: NUU (Nonbiological use, unclassified); PRP (Properties); USES (Uses)
(cyclic voltammetry on gold and nonanedithiol-**linked** gold **nanocrystal** and for nonanedithiol monolayer on gold and on platinum in potassium chloride soln.)

IT 13408-63-4, Ferrocyanide
RL: PRP (Properties); RCT (Reactant)
(cyclic voltammetry on gold and nonanedithiol-**linked** gold

nanocrystal and for nonanedithiol monolayer on gold and on platinum in potassium chloride soln.)

IT 143-10-2, Decanethiol 7440-57-5, Gold, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)
(self-assembled thin films on electrodes from thiolate-encapsulated gold **nanocrystals**)

RE.CNT 66

RE

(1) Ahmadi, T; Science 1996, V272, P1924 CA
(2) Alvarez, M; J Phys Chem B 1997, V101, P3706 CA
(3) Andres, R; Science 1996, V273, P1690 CA
(4) Badia, A; J Am Chem Soc 1997, V119, P2682 CA
(5) Bandyopadhyay, K; Langmuir 1997, V13, P5244 CA
(6) Bethell, D; J Electroanal Chem 1996, V409, P137 CA
(7) Bowden, N; Science 1997, V276, P233 CA
(8) Brousseau, L; J Am Chem Soc 1998, V120, P7645 CA
(9) Brown, K; J Amer Chem Soc 1996, V118, P1154 CA
(10) Brown Leif, D; J Am Chem Soc 1997, V119, P12384
(11) Brust, M; Adv Mater 1995, V7, P795 CA
(12) Brust, M; J Chem Soc Chem Commun 1994, P801 CA
(13) Brust, M; J Chem Soc Chem Commun 1995, P1655 CA
(14) Brust, M; Langmuir 1998, V14, P5425 CA
(15) Chen, S; J Phys Chem B 1998, V102, P9898 CA
(16) Chen, S; Science 1998, V280, P2098 CA
(17) Chumanov, G; J Phys Chem 1996, V100, P5166 CA
(18) Demaille, C; Anal Chem 1997, V69, P2323 CA
(19) Dorogi, M; Phys Rev B 1995, V52, P9071 CA
(20) Elghanian, R; Science 1997, V277, P1078 CA
(21) Fan, H; Langmuir 1997, V13, P119 CA
(22) Fendler, J; NATO ASI series 1996, V18 CA
(23) Fink, J; J Chem Mater 1998, V10, P922 CA
(24) Finklea, H; Electroanalytical Chemistry 1996, V19, P109 CA
(25) Freeman, R; Science 1995, V267, P17
(26) Giersig, M; Langmuir 1993, V9, P3408 CA
(27) Grabar, K; Anal Chem 1997, V69, P471 CA
(28) Green, S; J Phys Chem B 1997, V101, P2663 CA
(29) Green Stephen, J; Langmuir 1998, V14, P5612
(30) Hoetetler, M; Langmuir 1998, V14, P17
(31) Hornyak, G; J Phys Chem B 1997, V101, P1548 CA
(32) Hostetler, M; Curr Opin Colloid Interface Sci 1997, V2, P42 CA
(33) Hostetler, M; J Amer Chem Soc 1996, V118, P4212 CA
(34) Hostetler, M; J Amer Chem Soc 1998, V120, P9396 CA
(35) Hostetler, M; Langmuir 1996, V12, P3604 CA
(36) Hu, K; Chem Mater 1998, V10, P1160 CA
(37) Hulteen, J; J Phys Chem B 1997, V101, P7727 CA
(38) Hulteen, J; J Vac Sci Technol 1995, VA13, P1533
(39) Ingram, R; J Am Chem Soc 1997, V119, P9175 CA
(40) Ingram, R; J Amer Chem Soc 1996, V119, P9279
(41) Ingram, R; Langmuir 1998, V14, P4115 CA
(42) Johnson, S; Langmuir 1997, V13, P51 CA
(43) Keating, C; ACS SYMP Ser 1997, V679, P7 CA
(44) Luedtke, W; J Phys Chem 1996, V100, P13323 CA
(45) Mannakos, S; Chem Mater 1998, V10, P1214
(46) Mirkin, C; Nature 1996, V382, P607 CA
(47) Peschel, S; Angew Chem Int Ed 1995, V34, P1442 CA
(48) Pileni, M; Langmuir 1997, V13, P3266 CA
(49) Schon, G; Colloid Polymer Sci 1995, V273, P101
(50) Schon, G; Colloid Polymer Sci 1995, V273, P202
(51) Snow Arthur, W; Chem Mater 1998, V10, P947

(52) Terrill, R; J Amer Chem Soc 1995, V117, P12537 CA
(53) Ugo, P; Anal Chem 1996, V68, P4160 CA
(54) Walczak, M; J Electroanal Chem 1995, V396, P103 CA
(55) Wan, Z; J Phys Chem 1998, V102, P3068
(56) Wang, Z; Surf Sci 1997, V380, P302 CA
(57) Weisbecker, C; Langmuir 1996, V12, P3763 CA
(58) Whetten, R; Adv Mater 1996, V8, P428 CA
(59) Wuelfing, W; J Am Chem Soc 1998, V120, P12696 CA
(60) Yu, Y; J Phys Chem B 1997, V101, P6661 CA
(61) Zhang, J; Acc Chem Res 1997, V30, P423 CA
(62) Zhong, C; Anal Chem 1995, V67, P709A CA
(63) Zhong, C; J Electroanal Chem 1997, V425, P147 CA
(64) Zhong, C; J Electroanal Chem 1997, V421, P9 CA
(65) Zhong, C; MRS Fall Meeting 1998
(66) Zoval, J; Anal Chem 1996, V68, P1585 CA

L4 ANSWER 9 OF 10 CA COPYRIGHT 2001 ACS
AN 130:330032 CA
TI Electrode nanomaterials self-assembled from thiolate-encapsulated gold **nanocrystals**
AU Zhong, C. J.; Zheng, W. X.; Leibowitz, F. L.
CS Department of Chemistry, State University of New York at Binghamton, Binghamton, NY, 13902, USA
SO Electrochem. Commun. (1999), 1(2), 72-77
CODEN: ECCMF9; ISSN: 1388-2481
PB Elsevier Science B.V.
DT Journal
LA English
CC 72-2 (Electrochemistry)
Section cross-reference(s): 56
AB This paper describes the preliminary findings of an investigation of thin film assembly from monolayer-encapsulated gold **nanocrystals** and 1,9-nonanedithiols. The creation of novel electrode nanomaterials derived from intriguing combinations of the encapsulating **shells** and the particle **cores** constitutes the motivation of this work. Narrow-sized, shaped and encapsulated **nanocrystals** were assembled as thin films on different substrates via an exchange reaction between alkanethiolates on the **nanocrystal shells** and dithiols in the soln. Both microscopic and spectroscopic data have confirmed the formation of dithiol-**linked nanocrystals** in the thin films. The electrochem. study has revealed interesting parallels and differences between monolayers on planar and **nanocrystal** gold surfaces, which have important implications to the correlation between binding properties at **nanocrystal** facets and the electrode properties of this interesting class of composite nanomaterials.
ST gold nanoctystal thiolate encapsulation electrode nanomaterial thin film assembly
IT Films
(electrode nanomaterials self-assembled from thiolate-encapsulated gold **nanocrystals**)
IT Cyclic voltammetry
Nanocrystals
(for nonanedithiol monolayer and self-assembled layer from thiolate-encapsulated gold **nanocrystals**)
IT Microbalances
(in study of self-assembled layer from thiolate-encapsulated gold **nanocrystals**)

IT IR spectra
(of dithiol monolayers and thin film assembly from monolayer-encapsulated gold **nanocrystals** and 1,9-nonanedithiols)
IT Surface structure
(of thin film assembly from monolayer-encapsulated gold **nanocrystals** and 1,9-nonanedithiols)
IT 3489-28-9, 1,9-Nonanedithiol 7440-57-5, Gold, uses
RL: NUU (Nonbiological use, unclassified); PRP (Properties); USES (Uses)
(thin film assembly from monolayer-encapsulated gold **nanocrystals** and)

RE.CNT 49
RE
(1) Ahmadi, T; Science 1996, V272, P1924 CA
(2) Alvarez, M; J Phys Chem B 1997, V101, P3706 CA
(3) Andres, R; Science 1996, V273, P1690 CA
(4) Anon; NATO ASI Series 1996, V18
(5) Badia, A; J Am Chem Soc 1997, V119, P2682 CA
(6) Bandyopadhyay, K; Langmuir 1997, V13, P5244 CA
(7) Bethell, D; J Electroanal Chem 1996, V409, P137 CA
(8) Bowden, N; Science 1997, V276, P233 CA
(9) Brown, L; J Am Chem Soc 1997, V119, P12384 CA
(10) Brust, M; Adv Mater 1995, V7, P795 CA
(11) Brust, M; J Chem Soc, Chem Commun 1994, P801 CA
(12) Brust, M; Langmuir 1998, V14, P5425 CA
(13) Chen, S; Science 1998, V280, P2098 CA
(14) Chumanov, G; J Phys Chem 1996, V100, P5166 CA
(15) Demaille, C; Anal Chem 1997, V69, P2323 CA
(16) Elghanian, R; Science 1997, V277, P1078 CA
(17) Fan, H; Langmuir 1997, V13, P119 CA
(18) Fink, J; Chem Mater 1998, V10, P922 CA
(19) Finklea, H; Electroanalytical Chemistry 1996, V19, P109 CA
(20) Freeman, R; Science 1995, V267, P17
(21) Giersig, M; Langmuir 1993, V9, P3408 CA
(22) Hostetler, M; Curr Opin Colloid Interface Sci 1997, V2, P42 CA
(23) Hostetler, M; J Am Chem Soc 1996, V118, P4212 CA
(24) Hostetler, M; J Am Chem Soc 1998, V120, P9396 CA
(25) Hostetler, M; Langmuir 1996, V12, P3604 CA
(26) Hostetler, M; Langmuir 1998, V14, P17 CA
(27) Hu, K; Chem Mater 1998, V10, P1160 CA
(28) Hulteen, J; J Phys Chem B 1997, V101, P7727 CA
(29) Hulteen, J; J Vac Sci Technol A 1995, V13, P1533
(30) Johnson, S; Langmuir 1997, V13, P51 CA
(31) Keating, C; ACS Symp Ser 1997, V679, P7 CA
(32) Mannakos, S; Chem Mater 1998, V10, P1214
(33) Mirkin, C; Nature 1996, V382, P607 CA
(34) Nuzzo, R; J Am Chem Soc 1990, V112, P558 CA
(35) Peschel, S; Angew Chem, Int Ed Engl 1995, V34, P1442 CA
(36) Porter, M; J Am Chem Soc 1987, V109, P3559 CA
(37) Schon, G; Colloid Polym Sci 1995, V273, P101
(38) Snow, A; Chem Mater 1998, V10, P947 CA
(39) Walczak, M; J Electroanal Chem 1995, V396, P103 CA
(40) Weisbecker, C; Langmuir 1996, V12, P3763 CA
(41) Whetten, R; Adv Mater 1996, V8, P428 CA
(42) Yu, Y; J Phys Chem B 1997, V101, P6661 CA
(43) Zhang, J; Acc Chem Res 1997, V30, P423 CA
(44) Zhong, C; Anal Chem 1995, V67, P709A CA
(45) Zhong, C; J Electroanal Chem 1997, V425, P147 CA
(46) Zhong, C; J Electroanal Chem 1997, V421, P9 CA
(47) Zhong, C; Materials Research Society 1998 Fall Meeting 1998, Paper U5.13
(48) Zhong, C; submitted for publication

(49) Zoval, J; Anal Chem 1996, V68, P1585 CA

L4 ANSWER 10 OF 10 CA COPYRIGHT 2001 ACS
AN 123:70642 CA
TI **Nanocrystals** of II-VI semiconductor materials
AU Weller, Horst; Vossmeyer, Tobias; Eychmueller, Alexander; Mews, Alf; Katsikas, Lynne; Reck, Guenter
CS Inst. Phys. Chemie, Univ. Hamburg, Hamburg, D-20146, Germany
SO Mater. Res. Soc. Symp. Proc. (1995), 358(Microcrystalline and Nanocrystalline Semiconductors), 213-18
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal; General Review
LA English
CC 75-0 (Crystallography and Liquid Crystals)
Section cross-reference(s): 73
AB A review with 14 refs. CdS nanoclusters ranging in diam. between 1 and 4 nm were prepd. in aq. soln. using aliph. mercapto alcs. as ligands. The photon energies of the 1s1s absorption and the resp. oscillator strengths are in accordance with size quantization theory. Some clusters crystallize as macroscopic 3-dimensional superlattices which were studied by single crystal x-ray anal. The neutral Cd17S4(RS)26 clusters are covalently **linked** in the superlattice the structure of which exhibits self similarity to the interior structure of the clusters. Onion-**shell**-like composite particles from CdS and HgS were prepd. by successive substitution and re-pptn. processes. Particles with a **core** radius of 2 nm, a **shell** of up to 1 nm HgS followed by a final **shell** of up to 1.5 nm CdS were obtained. Electrons and holes were localized in the HgS **shell** giving rise to excitonic fluorescence.
ST review **nanocrystal** Group IIB chalcogenide; cadmium sulfide nanocluster review
IT Clusters
(cadmium sulfide nanoclusters)
IT Group IIB element chalcogenides
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**nanocrystals** of)
IT Crystallization
(of cadmium sulfide **nanocrystals**)
IT Fluorescence
(of cadmium sulfide-mercury sulfide composite particles)
IT 1344-48-5, Mercury sulfide (HgS)
RL: PRP (Properties)
(fluorescence of composite particles of cadmium sulfide and)
IT 1306-23-6, Cadmium sulfide (CdS), properties
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(**nanocrystals** and nanoclusters of)

=>
Connection closed by remote host

```
Trying 3106016892...Open

Welcome to STN International!  Enter x:x
LOGINID:SSSPTAU182CXC
PASSWORD:
TERMINAL (ENTER 1, 2, 3, OR ?):2


* * * * * * * * * *   Welcome to STN International   * * * * * * * * * *

 NEWS  1          Web Page URLs for STN Seminar Schedule - N. America
 NEWS  2  Dec 17  The CA Lexicon available in the CAPLUS and CA files
 NEWS  3  Feb 06  Engineering Information Encompass files have new names
 NEWS  4  Feb 16  TOXLINE no longer being updated
 NEWS  5  Apr 23  Search Derwent WPINDEX by chemical structure
 NEWS  6  Apr 23  PRE-1967 REFERENCES NOW SEARCHABLE IN CAPLUS AND CA
 NEWS  7  May 07  DGENE Reload
 NEWS  8  Jun 20  Published patent applications (A1) are now in USPATFULL
 NEWS  9  JUL 13  New SDI alert frequency now available in Derwent's
                  DWPI and DPCI

 NEWS EXPRESS  July 11 CURRENT WINDOWS VERSION IS V6.0b,
               CURRENT MACINTOSH VERSION IS V5.0C (ENG) AND V5.0JB (JP),
               AND CURRENT DISCOVER FILE IS DATED 06 APRIL 2001
 NEWS HOURS    STN Operating Hours Plus Help Desk Availability
 NEWS INTER    General Internet Information
 NEWS LOGIN    Welcome Banner and News Items
 NEWS PHONE    Direct Dial and Telecommunication Network Access to STN
 NEWS WWW      CAS World Wide Web Site (general information)

Enter NEWS followed by the item number or name to see news on that
specific topic.

  All use of STN is subject to the provisions of the STN Customer
  agreement.  Please note that this agreement limits use to scientific
  research.  Use for software development or design or implementation
  of commercial gateways or other similar uses is prohibited and may
  result in loss of user privileges and other penalties.

  * * * * * * * * * * * * * * STN  Columbus  * * * * * * * * * * * * * * *



FILE 'HOME' ENTERED AT 11:12:56 ON 13 AUG 2001

=> b uspatfull

COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                       ENTRY    SESSION
FULL ESTIMATED COST                                     0.15       0.15

FILE 'USPATFULL' ENTERED AT 11:13:09 ON 13 AUG 2001
CA INDEXING COPYRIGHT (C) 2001 AMERICAN CHEMICAL SOCIETY (ACS)

FILE COVERS 1971 TO PATENT PUBLICATION DATE: 9 Aug 2001 (20010809/PD)
FILE LAST UPDATED: 9 Aug 2001 (20010809/ED)
HIGHEST GRANTED PATENT NUMBER: US6249914
HIGHEST APPLICATION PUBLICATION NUMBER: US2001013137
CA INDEXING IS CURRENT THROUGH 9 Aug 2001 (20010809/UPCA)
```

ISSUE CLASS FIELDS (/INCL) CURRENT THROUGH: 9 Aug 2001 (20010809/PD)
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Apr 2001
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Apr 2001

>>> Page images are available for patents from 1/1/1998. Patents <<<
>>> and applications are typically loaded on the day of publication.<<<
>>> Page images are available for display by the following day. <<<
>>> Image data for the /FA field are available the following update.<<<

>>> Complete CA file indexing for chemical patents (or equivalents) <<<
>>> is included in file records. A thesaurus is available for the <<<
>>> USPTO Manual of Classifications in the /NCL, /INCL, and /RPCL <<<
>>> fields. This thesaurus includes catchword terms from the <<<
>>> USPTO/MOC subject headings and subheadings. Thesauri are also <<<
>>> available for the WIPO International Patent Classification <<<
>>> (IPC) Manuals, editions 1-6, in the /IC1, /IC2, /IC3, /IC4, <<<
>>> /IC5, and /IC (/IC6) fields, respectively. The thesauri in <<<
>>> the /IC5 and /IC fields include the corresponding catchword <<<
>>> terms from the IPC subject headings and subheadings. <<<

This file contains CAS Registry Numbers for easy and accurate
substance identification.

=> s nanocrystal?

L1 656 NANOCRYSTAL?

=> s quantum dot?

21348 QUANTUM
271948 DOT?
L2 347 QUANTUM DOT?
(QUANTUM(W)DOT?)

=> s l1 or l2

L3 962 L1 OR L2

=> s l3 and core?

254401 CORE?
L4 208 L3 AND CORE?

=> s l4 and shell?

164655 SHELL?
L5 57 L4 AND SHELL?

=> s l5 and link?

469548 LINK?
L6 29 L5 AND LINK?

=> d ti 1-29

L6 ANSWER 1 OF 29 USPATFULL
TI METHODS OF SELECTING INTERNALIZING ANTIBODIES

L6 ANSWER 2 OF 29 USPATFULL

TI Method for producing nanoparticles of transition metals

L6 ANSWER 3 OF 29 USPATFULL
TI **Nanocrystals** having polynucleotide strands and their use to form dendrimers in a signal amplification system

L6 ANSWER 4 OF 29 USPATFULL
TI Detection of chromosome copy number changes to distinguish melanocytic nevi from malignant melanoma

L6 ANSWER 5 OF 29 USPATFULL
TI Fluorescence filter cube for fluorescence detection and imaging

L6 ANSWER 6 OF 29 USPATFULL
TI Methods and assay kits for detecting altered mononuclear cell phenotype related to a pro-tumor immune response

L6 ANSWER 7 OF 29 USPATFULL
TI Water-soluble fluorescent **nanocrystals**

L6 ANSWER 8 OF 29 USPATFULL
TI Metal nanoshells

L6 ANSWER 9 OF 29 USPATFULL
TI Electrochromic polymeric solid films, manufacturing electrochromic devices using such solid films, and processes for making such films and devices

L6 ANSWER 10 OF 29 USPATFULL
TI Functionalized **nanocrystals** and their use in labeling for strand synthesis or sequence determination

L6 ANSWER 11 OF 29 USPATFULL
TI Method for preparation of metal intercalated fullerene-like metal chalcogenides

L6 ANSWER 12 OF 29 USPATFULL
TI Compounds and methods for depositing pure thin films of gallium nitride semiconductor

L6 ANSWER 13 OF 29 USPATFULL
TI Semiconductor **nanocrystal** probes for biological applications and process for making and using such probes

L6 ANSWER 14 OF 29 USPATFULL
TI Lipophilic, functionalized **nanocrystals** and their use for fluorescence labeling of membranes

L6 ANSWER 15 OF 29 USPATFULL
TI Continuous flow process for production of semiconductor **nanocrystals**

L6 ANSWER 16 OF 29 USPATFULL
TI Surface-functionalized, probe-containing nanospheres

L6 ANSWER 17 OF 29 USPATFULL
TI Magnetic storage medium formed of nanoparticles

L6 ANSWER 18 OF 29 USPATFULL
TI Nanostructured oxides and hydroxides and methods of synthesis therefor

L6 ANSWER 19 OF 29 USPATFULL
TI Methods for delivering bioactive agents to regions of elevated temperatures

L6 ANSWER 20 OF 29 USPATFULL
TI Fabrication of two-dimensionally arrayed quantum device

L6 ANSWER 21 OF 29 USPATFULL
TI Functionalized **nanocrystals** and their use in detection systems

L6 ANSWER 22 OF 29 USPATFULL
TI Magnetic nanocomposite compositions and processes for the preparation and use thereof

L6 ANSWER 23 OF 29 USPATFULL
TI Organo Luminescent semiconductor **nanocrystal** probes for biological applications and process for making and using such probes

L6 ANSWER 24 OF 29 USPATFULL
TI Electrochromic polymeric solid films, manufacturing electrochromic devices using such solid films, and processes for making such solid films and devices

L6 ANSWER 25 OF 29 USPATFULL
TI Methods of joining metal components and resulting articles particularly automotive torque converter assemblies

L6 ANSWER 26 OF 29 USPATFULL
TI Electrical component containing magnetic particles

L6 ANSWER 27 OF 29 USPATFULL
TI Magnetic refrigerant compositions and processes for making and using

L6 ANSWER 28 OF 29 USPATFULL
TI Targeted transfection nanoparticles

L6 ANSWER 29 OF 29 USPATFULL
TI **Nanocrystalline** magnetic iron oxide particles-method for preparation and use in medical diagnostics and therapy

=> d bib 1-29

L6 ANSWER 1 OF 29 USPATFULL
AN 2001:114494 USPATFULL
TI METHODS OF SELECTING INTERNALIZING ANTIBODIES
IN MARKS, JAMES D., KENSINGTON, CA, United States
POUL, MARIE ALIX, SAN FRANCISCO, CA, United States
BECERRIL, BALTAZAR, MORELOS, Mexico
PI US 2001008759 A1 20010719
AI US 1999-249529 A1 19990212 (9)
PRAI US 1998-82953 19980424 (60)
DT Utility
FS APPLICATION
LREP TOM HUNTER, C/O SKJERVEN MORRILL MACPHERSON LLP, 25 METRO DRIVE, SUITE 700, SAN JOSE, CA, 95110
CLMN Number of Claims: 50
ECL Exemplary Claim: 1

DRWN 9 Drawing Page(s)
LN.CNT 3118
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 2 OF 29 USPATFULL
AN 2001:112394 USPATFULL
TI Method for producing nanoparticles of transition metals
IN Murray, Christopher Bruce, New York, NY, United States
Sun, Shouheng, Ossining, NY, United States
PA International Business Machines Corporation, Armonk, NY, United States (U.S. corporation)
PI US 6262129 B1 20010717
AI US 1998-127005 19980731 (9)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Lovering, Richard D.
LREP McGinn & Gibb, PLLC
CLMN Number of Claims: 43
ECL Exemplary Claim: 1
DRWN 18 Drawing Figure(s); 16 Drawing Page(s)
LN.CNT 1278
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 3 OF 29 USPATFULL
AN 2001:112047 USPATFULL
TI **Nanocrystals** having polynucleotide strands and their use to form dendrimers in a signal amplification system
IN Barbera-Guillem, Emilio, Powell, OH, United States
Nelson, M. Bud, Worthington, OH, United States
Castro, Stephanie L., Columbus, OH, United States
PA Bio-Pixels Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6261779 B1 20010717
AI US 1999-437076 19991109 (9)
PRAI US 1998-107828 19981110 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Brusca, John S.; Assistant Examiner: Lundgren, Jeffrey S.
LREP Nelson, M. Bud
CLMN Number of Claims: 22
ECL Exemplary Claim: 1
DRWN 11 Drawing Figure(s); 7 Drawing Page(s)
LN.CNT 1547
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 4 OF 29 USPATFULL
AN 2001:112044 USPATFULL
TI Detection of chromosome copy number changes to distinguish melanocytic nevi from malignant melanoma
IN Bastian, Boris, San Francisco, CA, United States
Pinkel, Daniel, Walnut Creek, CA, United States
PA The Regents of the University of California, Oakland, CA, United States (U.S. corporation)
PI US 6261775 B1 20010717
AI US 1999-288940 19990409 (9)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Arthur, Lisa B.; Assistant Examiner: Goldberg, Jeanine

LREP Townsend and Townsend and Crew LLP
CLMN Number of Claims: 18
ECL Exemplary Claim: 1
DRWN 4 Drawing Figure(s); 4 Drawing Page(s)
LN.CNT 1458
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 5 OF 29 USPATFULL
AN 2001:98682 USPATFULL
TI Fluorescence filter cube for fluorescence detection and imaging
IN Barbera-Guillem, Emilio, Powell, OH, United States
PA BioCrystal Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6252664 B1 20010626
AI US 1999-419134 19991015 (9)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Evans, F. L.
LREP Nelson, M. Bud
CLMN Number of Claims: 30
ECL Exemplary Claim: 1
DRWN 10 Drawing Figure(s); 6 Drawing Page(s)
LN.CNT 815
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 6 OF 29 USPATFULL
AN 2001:97641 USPATFULL
TI Methods and assay kits for detecting altered mononuclear cell phenotype related to a pro-tumor immune response
IN Barbera-Guillem, Emilio, Powell, OH, United States
Nelson, M. Bud, Worthington, OH, United States
PA BioCrystal Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6251616 B1 20010626
AI US 1999-435289 19991105 (9)
RLI Continuation-in-part of Ser. No. US 1999-333103, filed on 15 Jun 1999, now abandoned
PRAI US 1999-115946 19990114 (60)
US 1999-117895 19990129 (60)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Eyler, Yvonne; Assistant Examiner: Nichols, Jennifer
LREP Nelson, M. Bud
CLMN Number of Claims: 8
ECL Exemplary Claim: 1
DRWN 8 Drawing Figure(s); 4 Drawing Page(s)
LN.CNT 2004
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 7 OF 29 USPATFULL
AN 2001:97328 USPATFULL
TI Water-soluble fluorescent **nanocrystals**
IN Bawendi, Moungi G., Boston, MA, United States
Mikulec, Frederick V., Somerville, MA, United States
Lee, Jin-Kyu, Seoul, Korea, Republic of
PA Massachusetts Institute of Technology, Cambridge, MA, United States (U.S. corporation)
PI US 6251303 B1 20010626
AI US 1998-156863 19980918 (9)
DT Utility
FS GRANTED
EXNAM Primary Examiner: Koslow, C. Melissa

LREP Fish & Richardson P.C.
CLMN Number of Claims: 43
ECL Exemplary Claim: 1
DRWN 9 Drawing Figure(s); 7 Drawing Page(s)
LN.CNT 1296
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 8 OF 29 USPATFULL
AN 2001:90132 USPATFULL
TI Metal nanoshells
IN Oldenburg, Steven J., Houston, TX, United States
Averitt, Richard D., Houston, TX, United States
Halas, Nancy J., Houston, TX, United States
PI US 2001002275 A1 20010531
AI US 2001-755229 A1 20010105 (9)
RLI Division of Ser. No. US 1998-38377, filed on 11 Mar 1998, PENDING
PRAI US 1997-40971 19970312 (60)
US 1997-40570 19970314 (60)
DT Utility
FS APPLICATION
LREP Sarah S. Bittner, Conley, Rose & Tayon, P.C., P.O. Box 3267, Houston, TX, 77253-3267
CLMN Number of Claims: 54
ECL Exemplary Claim: 1
DRWN 6 Drawing Page(s)
LN.CNT 1138

L6 ANSWER 9 OF 29 USPATFULL
AN 2001:85966 USPATFULL
TI Electrochromic polymeric solid films, manufacturing electrochromic devices using such solid films, and processes for making such films and devices
IN Varaprasad, Desaraju V., Holland, MI, United States
Zhao, Mingtang, Holland, MI, United States
Dornan, Craig Allen, Grand Haven, MI, United States
Agrawal, Anoop, Tucson, AZ, United States
Allemand, Pierre-Marc, Tucson, AZ, United States
Lynam, Niall R., Holland, MI, United States
PA Donnelly Corporation, Holland, MI, United States (U.S. corporation)
PI US 6245262 B1 20010612
AI US 1999-251937 19990218 (9)
RLI Continuation of Ser. No. US 1997-824501, filed on 27 Mar 1997, now patented, Pat. No. US 5910854 Continuation-in-part of Ser. No. US 1995-406663, filed on 20 Mar 1995, now abandoned Continuation of Ser. No. US 1994-193557, filed on 8 Feb 1994, now abandoned Continuation-in-part of Ser. No. US 1993-23675, filed on 26 Feb 1993, now abandoned
DT Utility
FS GRANTED
EXNAM Primary Examiner: Vargot, Mathieu D.
LREP Fitzpatrick, Cella, Harper & Scinto
CLMN Number of Claims: 25
ECL Exemplary Claim: 1
DRWN 2 Drawing Figure(s); 1 Drawing Page(s)
LN.CNT 5245

L6 ANSWER 10 OF 29 USPATFULL
AN 2001:59625 USPATFULL
TI Functionalized **nanocrystals** and their use in labeling for strand synthesis or sequence determination

IN Barbera-Guillem, Emilio, Powell, OH, United States
Nelson, M. Bud, Worthington, OH, United States
Castro, Stephanie L., Columbus, OH, United States
PA Bio-Pixels Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6221602 B1 20010424
AI US 1999-436159 19991109 (9)
PRAI US 1998-107829 19981110 (60)
US 1998-109626 19981124 (60)
DT Utility
FS Granted
EXNAM Primary Examiner: Fredman, Jeffrey; Assistant Examiner: Chakrabarti, Arun Kr.
LREP Nelson, M. Bud
CLMN Number of Claims: 22
ECL Exemplary Claim: 1
DRWN 4 Drawing Figure(s); 3 Drawing Page(s)
LN.CNT 1275
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 11 OF 29 USPATFULL
AN 2001:55421 USPATFULL
TI Method for preparation of metal intercalated fullerene-like metal chalcogenides
IN Homyonfer, Moshe, Holon, Israel
Tenne, Reshef, Rehovot, Israel
Feldman, Yishay, Ashdod, Israel
PA Yeda Research and Development Co., Ltd., Rehovot, Israel (non-U.S. corporation)
PI US 6217843 B1 20010417
WO 9823796 19980604
AI US 2000-308663 20000403 (9)
WO 1997-IL390 19971127
20000403 PCT 371 date
20000403 PCT 102(e) date
PRAI IL 1996-119719 19961129
DT Utility
FS Granted
EXNAM Primary Examiner: Turner, Archene
LREP Browdy and Neimark
CLMN Number of Claims: 21
ECL Exemplary Claim: 1
DRWN 15 Drawing Figure(s); 9 Drawing Page(s)
LN.CNT 1152
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 12 OF 29 USPATFULL
AN 2001:44401 USPATFULL
TI Compounds and methods for depositing pure thin films of gallium nitride semiconductor
IN Kouvetakis, John, Mesa, AZ, United States
McMurran, Jeff, Mesa, AZ, United States
PA Arizona Board of Regents, Tempe, AZ, United States (U.S. corporation)
PI US 6207844 B1 20010327
AI US 1999-310490 19990512 (9)
DT Utility
FS Granted
EXNAM Primary Examiner: Kopec, Mark
LREP Baker Botts L.L.P.
CLMN Number of Claims: 5
ECL Exemplary Claim: 1

DRWN 23 Drawing Figure(s); 18 Drawing Page(s)
LN.CNT 1380
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 13 OF 29 USPATFULL
AN 2001:43950 USPATFULL
TI Semiconductor **nanocrystal** probes for biological applications and process for making and using such probes
IN Weiss, Shimon, Pinole, CA, United States
Bruchez, Marcel, Albany, CA, United States
Alivisatos, Paul, Oakland, CA, United States
PA The Regents of the University of California, Oakland, CA, United States (U.S. corporation)
PI US 6207392 B1 20010327
AI US 1999-259982 19990301 (9)
RLI Continuation-in-part of Ser. No. US 1997-978450, filed on 25 Nov 1997, now patented, Pat. No. US 5990479
DT Utility
FS Granted
EXNAM Primary Examiner: Brusca, John S.; Assistant Examiner: Siu, Stephen
LREP Martin, Paul R., Taylor, Kerry S., Taylor, John F.
CLMN Number of Claims: 155
ECL Exemplary Claim: 1
DRWN 6 Drawing Figure(s); 4 Drawing Page(s)
LN.CNT 2646
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 14 OF 29 USPATFULL
AN 2001:29366 USPATFULL
TI Lipophilic, functionalized **nanocrystals** and their use for fluorescence labeling of membranes
IN Barbera-Guillem, Emilio, Powell, OH, United States
PA Bio-Pixels Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6194213 B1 20010227
AI US 1999-458752 19991210 (9)
DT Utility
FS Granted
EXNAM Primary Examiner: Leary, Louise N.
LREP Nelson, M Bud
CLMN Number of Claims: 21
ECL Exemplary Claim: 1
DRWN 2 Drawing Figure(s); 1 Drawing Page(s)
LN.CNT 918
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 15 OF 29 USPATFULL
AN 2001:13773 USPATFULL
TI Continuous flow process for production of semiconductor **nanocrystals**
IN Barbera-Guillem, Emilio, Powell, OH, United States
Thurston, Marlin O., Columbus, OH, United States
PA BioCrystal Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6179912 B1 20010130
AI US 1999-468418 19991220 (9)
DT Utility
FS Granted
EXNAM Primary Examiner: Kunemund, Robert
LREP Nelson, M. Bud
CLMN Number of Claims: 27
ECL Exemplary Claim: 11

DRWN 4 Drawing Figure(s); 4 Drawing Page(s)
LN.CNT 1116
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 16 OF 29 USPATFULL
AN 2001:10550 USPATFULL
TI Surface-functionalized, probe-containing nanospheres
IN Guo, Congyuan, Columbia, MO, United States
Thomas, Rhys N., Fayette, MO, United States
PA Fayette Environmental Services, Inc., Fayette, MO, United States (U.S. corporation)
PI US 6177088 B1 20010123
AI US 1999-226233 19990107 (9)
DT Utility
FS Granted
EXNAM Primary Examiner: Kulkosky, Peter F.
LREP Simunic, Joan L.Stites & Harbison
CLMN Number of Claims: 29
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 850
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 17 OF 29 USPATFULL
AN 2000:170758 USPATFULL
TI Magnetic storage medium formed of nanoparticles
IN Black, Charles T., White Plains, NY, United States
Gates, Stephen M., Ossining, NY, United States
Murray, Christopher B., New York, NY, United States
Sun, Shouheng, Ossining, NY, United States
PA International Business Machines Corporation, Armonk, NY, United States (U.S. corporation)
PI US 6162532 20001219
AI US 1998-127453 19980731 (9)
DT Utility
FS Granted
EXNAM Primary Examiner: Kiliman, Leszek
LREP McGinn & Gibb, P.C.
CLMN Number of Claims: 20
ECL Exemplary Claim: 1
DRWN 8 Drawing Figure(s); 6 Drawing Page(s)
LN.CNT 638
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 18 OF 29 USPATFULL
AN 2000:170756 USPATFULL
TI Nanostructured oxides and hydroxides and methods of synthesis therefor
IN Xiao, Tongsan D., Rocky Hill, CT, United States
Strutt, Peter R., Mansfield Center, CT, United States
Kear, Bernard H., Whitehouse Station, NJ, United States
Chen, Huimin, Storrs, CT, United States
Wang, Donald M., Storrs, CT, United States
PA University of Connecticut, Storrs, CT, United States (U.S. corporation)
PI US 6162530 20001219
AI US 1997-971817 19971117 (8)
PRAI US 1996-31355 19961118 (60)
US 1996-31672 19961122 (60)
US 1997-39888 19970305 (60)
DT Utility
FS Granted

EXNAM Primary Examiner: Raimund, Christopher
LREP Cantor Colburn LLP
CLMN Number of Claims: 51
ECL Exemplary Claim: 1
DRWN 40 Drawing Figure(s); 20 Drawing Page(s)
LN.CNT 1455

L6 ANSWER 19 OF 29 USPATFULL
AN 2000:149698 USPATFULL
TI Methods for delivering bioactive agents to regions of elevated temperatures
IN Unger, Evan C., Tucson, AZ, United States
PA ImaRx Pharmaceutical Corp., Tucson, AZ, United States (U.S. corporation)
PI US 6143276 20001107
AI US 1997-823791 19970321 (8)
DT Utility
FS Granted
EXNAM Primary Examiner: Dees, Jose' G.; Assistant Examiner: Hartley, Michael G.
LREP Woodcock, Washburn, Kurtz, Mackiewicz & Norris LLP
CLMN Number of Claims: 60
ECL Exemplary Claim: 1
DRWN 4 Drawing Figure(s); 4 Drawing Page(s)
LN.CNT 3331
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 20 OF 29 USPATFULL
AN 2000:124852 USPATFULL
TI Fabrication of two-dimensionally arrayed quantum device
IN Yamashita, Ichiro, Nara, Japan
PA Matsushita Electric Industrial Co., Ltd., Osaka, Japan (non-U.S. corporation)
PI US 6121075 20000919
AI US 1999-228276 19990111 (9)
RLI Division of Ser. No. US 1998-86672, filed on 29 May 1998
PRAI JP 1997-157436 19970530
DT Utility
FS Granted
EXNAM Primary Examiner: Bowers, Charles; Assistant Examiner: Christianson, Keith
LREP Wenderoth, Lind & Ponack, L.L.P.
CLMN Number of Claims: 2
ECL Exemplary Claim: 1
DRWN 15 Drawing Figure(s); 6 Drawing Page(s)
LN.CNT 641
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 21 OF 29 USPATFULL
AN 2000:117419 USPATFULL
TI Functionalized **nanocrystals** and their use in detection systems
IN Castro, Stephanie L., Columbus, OH, United States
Barbera-Guillem, Emilio, Powell, OH, United States
PA BioCrystal Ltd., Westerville, OH, United States (U.S. corporation)
PI US 6114038 20000905
AI US 1999-372729 19990811 (9)
PRAI US 1998-107829 19981110 (60)
DT Utility
FS Granted
EXNAM Primary Examiner: Nutter, Nathan M.

LREP Nelson, M. Bud
CLMN Number of Claims: 47
ECL Exemplary Claim: 1
DRWN 4 Drawing Figure(s); 3 Drawing Page(s)
LN.CNT 1109
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 22 OF 29 USPATFULL
AN 2000:44159 USPATFULL
TI Magnetic nanocomposite compositions and processes for the preparation and use thereof
IN Ziolo, Ronald F., Webster, NY, United States
Braungart, Kathleen M., Rochester, NY, United States
PA Xerox Corporation, Stamford, CT, United States (U.S. corporation)
PI US 6048920 20000411
AI US 1994-290125 19940815 (8)
DT Utility
FS Granted
EXNAM Primary Examiner: Yoon, Tae
LREP Haack, John L.
CLMN Number of Claims: 3
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 713
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 23 OF 29 USPATFULL
AN 1999:151577 USPATFULL
TI Organo Luminescent semiconductor **nanocrystal** probes for biological applications and process for making and using such probes
IN Weiss, Shimon, Pinole, CA, United States
Bruchez, Jr., Marcel, Albany, CA, United States
Alivisatos, Paul, Oakland, CA, United States
PA Regents of the University of California, Oakland, CA, United States (U.S. corporation)
PI US 5990479 19991123
AI US 1997-978450 19971125 (8)
DT Utility
FS Granted
EXNAM Primary Examiner: Berman, Jack I.
LREP Taylor, John P., Martin, Paul R., Taylor, Kerry S.
CLMN Number of Claims: 50
ECL Exemplary Claim: 1
DRWN 5 Drawing Figure(s); 3 Drawing Page(s)
LN.CNT 1013
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 24 OF 29 USPATFULL
AN 1999:65607 USPATFULL
TI Electrochromic polymeric solid films, manufacturing electrochromic devices using such solid films, and processes for making such solid films and devices
IN Varaprasad, Desaraju V., Holland, MI, United States
Zhao, Mingtang, Holland, MI, United States
Dornan, Craig Allen, Grand Haven, MI, United States
Agrawal, Anoop, Tucson, AZ, United States
Allemand, Pierre-Marc, Tucson, AZ, United States
Lynam, Niall R., Holland, MI, United States
PA Donnelly Corporation, Holland, MI, United States (U.S. corporation)
PI US 5910854 19990608

AI US 1997-824501 19970326 (8)
RLI Continuation-in-part of Ser. No. US 1995-406663, filed on 20 Mar 1995, now abandoned which is a continuation of Ser. No. US 1994-193557, filed on 8 Feb 1994, now abandoned which is a continuation-in-part of Ser. No.
US 1993-23675, filed on 26 Feb 1993, now abandoned
DT Utility
FS Granted
EXNAM Primary Examiner: Epps, Georgia; Assistant Examiner: Bey, Dawn-Marie
LREP Fitzpatrick Cella Harper & Scinto
CLMN Number of Claims: 27
ECL Exemplary Claim: 1
DRWN 2 Drawing Figure(s); 1 Drawing Page(s)
LN.CNT 5364
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 25 OF 29 USPATFULL
AN 1999:56176 USPATFULL
TI Methods of joining metal components and resulting articles particularly automotive torque converter assemblies
IN Mistry, Pravin, Shelby Township, MI, United States
Liu, Shengzhong, Canton, MI, United States
Turchan, Manuel C., Northville, MI, United States
PA QQC, Inc., Dearborn, MI, United States (U.S. corporation)
PI US 5902498 19990511
AI US 1997-822829 19970324 (8)
RLI Continuation of Ser. No. US 1994-366782, filed on 30 Dec 1994, now abandoned which is a continuation-in-part of Ser. No. US 1994-297986, filed on 30 Aug 1994, now abandoned which is a continuation-in-part of Ser. No. US 1994-296550, filed on 25 Aug 1994, now abandoned
DT Utility
FS Granted
EXNAM Primary Examiner: Mills, Gregory
LREP Harness, Dickey & Pierce, P.L.C.
CLMN Number of Claims: 37
ECL Exemplary Claim: 1
DRWN 19 Drawing Figure(s); 7 Drawing Page(s)
LN.CNT 1575
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 26 OF 29 USPATFULL
AN 1998:150585 USPATFULL
TI Electrical component containing magnetic particles
IN Swift, Joseph A., Ontario, NY, United States
Ziolo, Ronald F., Webster, NY, United States
Wallace, Stanley J., Victor, NY, United States
PA Xerox Corporation, Stamford, CT, United States (U.S. corporation)
PI US 5843567 19981201
AI US 1997-868390 19970603 (8)
DT Utility
FS Granted
EXNAM Primary Examiner: Krass, Frederick
LREP Soong, Zosan S.
CLMN Number of Claims: 17
ECL Exemplary Claim: 1
DRWN 9 Drawing Figure(s); 3 Drawing Page(s)
LN.CNT 1104
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 27 OF 29 USPATFULL

AN 97:53876 USPATFULL
TI Magnetic refrigerant compositions and processes for making and using
IN Ziolo, Ronald F., Webster, NY, United States
Kroll, Elizabeth C., Hamilton, Canada
Palacios, Javier Tejada, Barcelona, Spain
Zhang, Xixiang, Barcelona, Spain
PA Xerox Corporation, Stamford, CT, United States (U.S. corporation)
PI US 5641424 19970624
AI US 1995-500215 19950710 (8)
DT Utility
FS Granted
EXNAM Primary Examiner: Bonner, Melissa
LREP Haack, John L.
CLMN Number of Claims: 15
ECL Exemplary Claim: 1
DRWN 1 Drawing Figure(s); 1 Drawing Page(s)
LN.CNT 1093
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 28 OF 29 USPATFULL
AN 95:94698 USPATFULL
TI Targeted transfection nanoparticles
IN Kossovsky, Nir, Los Angeles, CA, United States
Hnatyszyn, H. James, Los Angeles, CA, United States
Gelman, Andrew, Los Angeles, CA, United States
PA The Regents of the University of California, Oakland, CA, United States (U.S. corporation)
PI US 5460831 19951024
AI US 1993-147751 19931104 (8)
DCD 20100112
RLI Continuation-in-part of Ser. No. US 1993-199, filed on 4 Jan 1993, now patented, Pat. No. US 5334394 which is a continuation-in-part of Ser. No. US 1991-690601, filed on 24 Apr 1991, now patented, Pat. No. US 5178882 which is a continuation-in-part of Ser. No. US 1990-542255, filed on 22 Jun 1990, now patented, Pat. No. US 5219577
DT Utility
FS Granted
EXNAM Primary Examiner: Page, Thurman K.; Assistant Examiner: Spear, James M.
LREP Poms, Smith, Lande & Rose
CLMN Number of Claims: 16
ECL Exemplary Claim: 1
DRWN No Drawings
LN.CNT 895
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L6 ANSWER 29 OF 29 USPATFULL
AN 95:57876 USPATFULL
TI **Nanocrystalline** magnetic iron oxide particles-method for preparation and use in medical diagnostics and therapy
IN Kresse, Mayk, Berlin, Germany, Federal Republic of
Lawaczeck, Rudiger, Berlin, Germany, Federal Republic of
Pfefferer, Detlef, Berlin, Germany, Federal Republic of
PA Institut fur Diagnostikforschung GmbH an der Freien Universitat Berlin, Berlin, Germany, Federal Republic of (non-U.S. corporation)
PI US 5427767 19950627
AI US 1992-882130 19920513 (7)
PRAI DE 1991-41177827 19910528
DT Utility
FS Granted
EXNAM Primary Examiner: Hollinden, Gary E.